REMARKS/ARGUMENTS

In an Office Action dated August 4, 2005 claims 1-32 were rejected under § 102 based on Yamamoto. Applicants respectfully traverse the rejection and request consideration of the following arguments.

Specification Amendment

The specification is amended to fill in the missing portions of the list of related cases in paragraph [0003].

Brief Review of Described Embodiments

Prior to addressing the rejections, Applicants consider it helpful to provide this brief review of various of the described embodiments.

One embodiment provides a device which is placed into a communications fabric, particularly a storage area network (SAN) to virtualize the storage provided on the SAN. The embodiment provides this virtualization as an element in fabric, not as a device which acts as a gateway or even part of the hosts or servers or as a module included in a storage unit. This allows heterogeneous virtualization with full fabric configuration flexibility.

To accomplish this virtualization in the fabric the embodiment uses a series of ports and port processors to connect to the fabric, with the port processors connected by an internal crossbar switch. A control unit is provided to coordinate the port processors and handle higher level operations. See Figure 4. In the preferred embodiment each port processor actually includes a number of individual embedded processors, with various queues and hardware support. See Figure 5. The embedded processors run various software modules to provide major components of the desired virtualization. As shown in Figure 22, in this embodiment the ingress port processor includes a virtual target module to provide the desired functionality for frames directed to the virtual disk represented by the particular port or the device. The virtual target appears to the host to be a storage unit and communicates with the host like a physical target, even though it is

virtual. The virtual target module communicates with a virtual initiator module also contained in the port processor. The virtual initiator works with the physical storage units and appears as a host to those physical storage units. The various operations of the virtual target and virtual initiator can be seen in Figs. 24 – 28 for various read and write operation alternatives. As can be seen, there is a great deal of interaction between the virtual target and virtual initiator for each frame.

Therefore the embodiment is positioned in the fabric between the host and the storage unit and presents itself as a storage unit to the host and as a host to the storage unit. By changing mapping tables internal to the embodiment the actual physical storage unit or portion can be changed without the need to reconfigure the host.

§ 102 Rejections

Claim 1

Claim 1 was rejected over Yamamoto. Specifically, the Office Action references paragraphs 20 and 23 to allegedly show a switch coupling said port processors and paragraph 21 to allegedly show a control module and apparently to also show the I/O module and control module being configured to interactively support data virtualization. Applicants traverse these points.

Paragraph 23 of Yamamoto is provided here for reference:

> **[0023]** Continuing with **FIG. 1**, the various adaptors **26**, . . . , **32** of the storage controller **14** connect to drive interface adaptors **46**, one for each physical disk unit **20**, through a system bus **36A**, **36B**, and a connecting facility **40**. The connecting facility is basically an arbiter that functions to arbitrate communicative access between the various interface adaptors **26**, . . . , **32** and the drive interface adaptors **46**. In addition the connecting facility **40** will also arbitrate access for the interface adaptors **26**, . . . , **32** to the cache memory **42**.

Apparently the connecting facility 40 is being equated to the switch of claim 1. However, this is improper. Yamamoto clearly says the connecting facility 40 is

"basically an arbiter." This correlates well when it is noted that the interface adaptors are connected by a system bus 36A and the drive interface adapters are connected by a system bus 36B. Additionally, a cache memory 42 is shown, presumably also with a bus interface. With these various buses, the connecting facility 40 would be an arbiter as specifically stated in Yamamoto. It would not be a switch as required in the claims. This is a first missing element.

Applicants further submit that Yamamoto does not show the claimed control module. The Office Action references paragraph 21, but this paragraph only describes the various interface adapters 26 – 32. As these have apparently already been correlated to be the port processors by referencing paragraph 22, this leaves nothing in paragraph 21 to properly correspond to the required control module.

Further, there is nothing in paragraph 21 to show data virtualization as required in the claim.

Applicants thus submit that numerous elements of claim 1 are not shown in Yamamoto when the claim and Yamamoto are fully considered.

Claim 2

The Office Action references paragraph 29 of Yamamoto with respect to claim 2. Applicants traverse this rejection. Paragraph 29 describes various interface adapters at very high levels. Applicants do not find anything in the paragraph that properly corresponds to a virtual target task and find nothing even remotely similar to a virtual initiator task. Therefore the rejection is improper and should be withdrawn.

Claim 3

The Office Action references paragraphs 29 and 35 – 39 with respect to claim 3. Applicants can find nothing in paragraphs 35 – 39 which are relevant to claim 3 except for a reference to a logical volume address converter function 76, which has been mentioned generally in paragraph 29. None of the lock/unlock items which consume much of paragraphs 35 – 39 are relevant to claim 3. Thus Applicants submit that similar elements to those in claim 2, namely virtual target and virtual initiator, are not shown in Yamamoto.

Claim 5

The arguments of claim 2 apply directly to claim 5 so Applicants submit that claim 5 is allowable.

Claim 7

The Office Action references paragraphs 32 – 34 of Yamamoto to support the rejection of claim 7. Claim 7 relates to a port processor and the virtual initiator task. The Office Action has previously defined the interface adapters 26 – 32 of Yamamoto as the port processors. But paragraphs 32 – 34 relate to the drive interface adaptors 46, entirely separate elements from the interface adapters 26 – 32. Thus there can be no showing that anything in those paragraphs is the port processors equivalent, and would not be, because Yamamoto clearly requires them to be separated. Therefore the rejection of claim 7 is improper and must be withdrawn.

Claim 8

The Office Action cites paragraph 41 for support to reject claim 8. Applicants note that paragraph 41 also relates to the drive interface adaptor 46 so it cannot be applied to items in the port processor, as required by claim 8.

Claims 9 and 17

While the Office Action specifically points out the host and storage devices in Yamamoto, it fails to provide any item correlating to the "at least one switch for coupling to the at least one host and the at least one storage device" required in both claims. This is in addition to not having support for the switch coupling the port processors as described above with respect to claim 1. Therefore claims 9 and 17 are allowable for these further reasons.

Claims 9 – 32

The arguments above with respect to claims 1 – 3, 5, 7 and 8 apply to their corresponding claims on claims 9 – 32, thus rendering those claims allowable.

CONCLUSION

Based on the above remarks Applicants respectfully submit that all of the present claims are allowable. Reconsideration is respectfully requested.

Respectfully submitted,

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Date

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